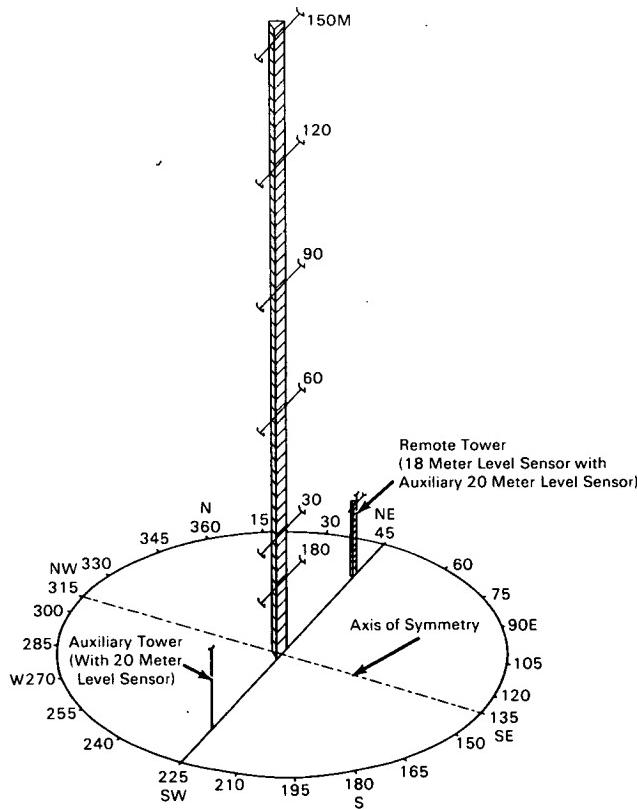


# NASA TECH BRIEF



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## Wind Tower Influence Study



### The problem:

To determine whether a meteorological tower significantly influences the winds as measured by sensors mounted on it, and, if so, to provide the means to correct the measured wind speeds and directions to approximate the free-stream wind.

### The solution:

Determination of a set of correction factors that can be applied to the measured mean wind speed and direction so that close approximations of the mean speed and direction of the free-stream wind can be obtained. These correction factors can then be used to study quantitatively the amount of tower influence and to obtain any necessary speed and direction corrections. Experimentally, measured winds are compared to winds obtained from a reference sensor in an "undisturbed" location.

### How it's done:

In this study, a set of correction factors for wind speed was obtained by computing ratios of measured mean wind speed to reference mean wind speed. Also, a set of correction factors for wind direction was obtained by algebraically subtracting the measured mean wind direction from the reference wind direction. A supporting theoretical study was also performed to confirm the experimental work.

The experimental setup is shown in the figure. The meteorological tower is a 150-meter steel lattice-type that supports wind sensors at several heights above the ground. Horizontal cross section of the tower is a 2.45-meter (8-ft.) equilateral triangle, and the wind sensors are attached at the tips of 3.66-meter (12-ft) booms that extend northeast and southwest of the tower.

A wind director selector is employed to determine which sensor (northeast or southwest) is windward of the tower and to engage it for monitoring the wind.

**Note:**

Requests for further information may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B69-10653

**Patent status:**

No patent action is contemplated by NASA.

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